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Identified Priority 2 Concerns

Loading to be reduced for both buildings as storage areas surpass prescribed limits

Interrupted movement joint at main staircase



1st Priority 2 Concern

During our visit, we have found that the floors used for excessive storage. For example, on the 3rd floor of the front building, we found a cantilevered section loaded at 6 kPa. The factory and floor manager were advised to lower the height of the storage by half in that area.

We also noticed that some construction material stored at the roof. Loading of the roof has to be limited to a minimum.

This concern is applicable for both buildings



2nd Priority 2 Concern

During our visit, we have found that the main staircase, also used as an emergency egress, was connected to both buildings.

As the 2 buildings have different geometries, number of floors and floor heights, they will both act differently under seismic loading. There is reasonable doubt that the staircase will act as a restraint and attract lateral loads for which it is not designed.

If this staircase was to fail during an earthquake, the building would lose a main means for escape.



Building gap

Identified Priority 3 Concerns

Eccentricities at beam to column connexions

Slab reinforcing detail for long spans

Cantilevered exit staircase

Leaking water tank at roof

Waterproofing to be repaired

Steel roofing and shed



At last floor of back building below communication tower

1st Priority 3 Concern

During our survey, we have found multiple beams with a certain eccentricity with regard to the column. This can create an unwanted moment in the column.

We require that these columns be checked for compression vs moment interaction in a Detailed Engineering Assessment.



At ground floor entrance of front building



Below first floor slab of front building - entrance

2nd Priority 3 Concern

During our survey, we have found structural elements that seem unorthodox. We require a full detailed engineering assessment of the steel reinforcing elements.



3rd Priority 3 Concern

At the front building, there is a cantilevered building with an inadequate bamboo railing poorly fastened. This is to be replaced immediately by standard steel railing



4th Priority 3 Concern

On the roof of the back building, the water tank is leaking from a poorly sealed connexion with piping. The rate of leaking is enough to create a small accumulation of water. Refer to waterproofing concern.



5th Priority 3 Concern

During our survey, we noticed a cement based waterproofing finish. In certain areas, it has been damaged by construction material storage. Consequently, any cracks or damage in the surface finishes on the roof will allow water to seep into the concrete slab beneath the finishes, and cause long-term soaking of the slab. Same goes for water tanks at roof.



6th Priority 3 Concern

There are some small section of steel roofing on for sheds on both roofs. 1 close to the communication tower, 1 over the joint and 1 over the elevator shaft.

We surveyed a steel angle column, roughly 3m high, with a damaged bottom. This space should stay unoccupied.

Overall Stability System



The overall stability of both buildings is probably provided by a moment frame which requires special detailing at the beam to column connections. Such details were not available in the construction drawings.

Brick walls infills cannot be considered in the lateral load resisting system as they are not restrained.

We have one main concern with regards to the surveyed system. The first one is the fact that both buildings are connected at the main staircase. This can alter load distribution and create load concentration at the staircase, which could fail and prevent emergency egress.

A Detail Engineering Assessment should be carried out with regard to the current system.

Priority Actions

Problems Observed Summary

ITEM 1: Priority 2 - Heavy loading in multiple areas

ITEM 2: Priority 2 - Interrupted movement joint at main staircase

ITEM 3: Priority 3 - Eccentricities at beam to column connexions

ITEM 4: Priority 3 - Slab reinforcing detail for long spans

ITEM 5: Priority 3 - Cantilevered exit staircase

ITEM 6: Priority 3 - Leaking water tank at roof

ITEM 7: Priority 3 – Waterproofing at roof

ITEM 8: Priority 3 – Steel roof and shed

Item 1 and actions

Heavy loading in multiple areas

Priority 1 (Immediate – Now)

- Limit storage height

Priority 2 (within 6 – weeks)

- Produce and actively manage a loading plan for all floor plates within the factory giving consideration to floor and column capacities.
- Verify in situ concrete stresses either by 100mm dia. Cores.

Priority 3 (within 6-months)

- None

Item 2 and actions

Interrupted movement joint at main staircase

Priority 1 (Immediate – Now)

- None

Priority 2 (within 6 – weeks)

- A Detailed Engineering Assessment should be carried out with regard to the current lateral system.

Priority 3 (within 6-months)

- None

Item 3 and actions

Eccentricities at beam to column connections.

Priority 1 (Immediate – Now)

- None

Priority 2 (within 6 – weeks)

- None

Priority 3 (within 6-months)

- A Detailed Engineering Assessment of columns with eccentric loading is to be commenced, see attached scope.

Item 4 and actions

Slab reinforcing detail for long spans.

Priority 1 (Immediate – Now)

- None

Priority 2 (within 6 – weeks)

- None

Priority 3 (within 6-months)

- A Detailed Engineering Assessment of the reinforcing is to be commenced, see attached scope.

Item 5 and actions

Cantilevered exit staircase

Priority 1 (Immediate – Now)

- Replace bamboo railing by adequate standard railing system.

Priority 2 (within 6 – weeks)

- None

Priority 3 (within 6-months)

- None

Item 6 and actions

Leaking water tank at roof level.

Priority 1 (Immediate – Now)

- Repair leak to prevent any further water ingress.

Priority 2 (within 6 – weeks)

- None.

Priority 3 (within 6-months)

- None.

Item 7 and actions

Waterproofing to be repaired

Priority 1 (Immediate – Now)

- None

Priority 2 (within 6 – weeks)

- None

Priority 3 (within 6-months)

- Repair waterproofing where damaged and waterproof areas where no protection is provided.

Item 8 and actions

Steel roof and shed.

Priority 1 (Immediate – Now)

- None

Priority 2 (within 6 – weeks)

- None

Priority 3 (within 6-months)

- A Detailed Engineering Assessment of the columns with the eccentric loading is to be commenced, see attached scope.